Space Weather Forecast

Issued on Saturday, 29 July 2023 at 01:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Ongoing daily risk of R1/R2 radio blackouts. Risk of Minor Proton storms on 29 Jul.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate, due to a region which cross over the northwestern limb 24 hours ago. A Moderate flare from this region rose above the horizon and was detected at Earth. A CME (coronal mass ejection) from this region has been analysed and determined to have no Earth-directed components. A region in the south-central disc has developed in complexity and also produced a CME early on 28 Jul which is not Earth-directed. A region in the northeast quadrant, along with several along the eastern limb will be monitored for further developments or increases in activity. No new CMEs have been observed leaving the surface of the Sun.

Solar Wind / Geomagnetic Activity: The solar wind has steadily declined from slightly elevated to background levels through the day. Total magnetic field strength has been weak, with the north-south component also varying weakly, but with some sustained negative (southward) periods. Total geomagnetic activity was Quiet with one Unsettled interval at the end of the forecast period.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary
Solar Activity: There is a chance of M-class flaring throughout the period, with an increased risk of 29 Jul due to the risk of further flaring from an active region beyond the northwestern limb. A number of regions on the eastern limb are likely to be re-classified as more complex regions in the forthcoming days with consequent increase in risk of M-class flares.

Solar Wind / Geomagnetic Activity: Two CMEs, from the south central disc and from just beyond the northwestern limb were analysed, with neither showing an Earth-directed component. Three further filament eruptions, most notably from a large filament in the northeast are in progress and will be assessed as imagery becomes available, but may affect the forecast towards the end of the period. Otherwise no coronal hole high speed streams are forecast to connect with Earth, with mainly ambient speeds expected. Quiet geomagnetic activity is currently expected throughout, considering the above caveats.

Energetic Particles / Solar Radiation: There is a chance of the high energy (greater than 10MeV) proton flux reaching the Minor Storm level on 29 Jul in the absence of further eruptions a complex region just beyond the western limb. The risk is then expected to decline through the period as this region moves further onto the far side and the current proton levels subsiding.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	30	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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